

WHAT IS CLAIMED IS:

1. A lid assembly for a semiconductor processing system, said lid assembly comprising:
  - a lid having first and second opposed surfaces
  - a plurality of controllable flow channels extending from the first and second opposed surfaces;
  - a gas control system disposed on the first surface and operably opening and closing the channels; and
  - a mixer coupled to the second surface of the lid, the mixer having a central passage in communication with the flow channels.
2. The lid assembly of claim 1, wherein the gas control system further comprises:
  - a gas manifold disposed on the lid; and
  - at least one valve coupled to the gas manifold adapted to control a flow through one of the flow channels.
3. The lid assembly of claim 1, wherein the gas control system further comprises:
  - a gas manifold disposed on the lid;
  - at least one valve coupled to the gas manifold adapted to control a flow through one of the flow channels; and
  - a reservoir coupled to the valve.
4. The lid assembly of claim 1, wherein the gas control system further comprises:
  - a gas manifold having an upper surface and lower surface;
  - a first channel, a second channel and a third channel each extending through the gas manifold and exiting the lower surface; and
  - a fourth channel extending from the upper surface and coupling to the third channel.

5. The lid assembly of claim 4, wherein the gas control system further comprises:

a cleaning source fluidly coupled to the fourth channel.

6. The lid assembly of claim 4, wherein the gas manifold further comprises:

a conduit disposed therein adapted to flow a heat transfer fluid therethrough.

7. The lid assembly of claim 1, wherein the lower surface of the gas manifold further comprises a plurality of bosses that contact the lid.

8. A lid assembly for a semiconductor processing system, said lid assembly comprising:

a lid having first and second opposed surfaces, the first and second opposed surfaces having a first inlet channel, a second inlet channel and a third inlet channel disposed therethrough;

a gas manifold coupled to the first surface of the lid, the gas manifold comprising:

a body having an upper surface and lower surface;

a first channel, a second channel and a third channel each extending through the gas manifold to the lower surface; and

a baffle plate having a first side and a second side, the first side coupled to the second surface of the lid and having a recess formed therein, the recess defining a plenum with the second surface of the lid and fluidly communicating with the first, second and third channels via the inlet channels disposed in the lid, the baffle plate having a center passage disposed therethrough providing a singular passageway between the plenum and the second side of the baffle plate.

9. The lid assembly of claim 8, wherein the baffle plate further comprises a mixing lip defined by a bottom of the recess and the center passage, the mixing lip having an inner tip disposed radially inwards of the inlet passages.

10. The lid assembly of claim 9, wherein the tip is rounded.

11. The lid assembly of claim 9, wherein the mixing lip further comprises a sculpted surface.

mixing lip defines an acute angle with the second side of the baffle plate.

12. The lid assembly of claim 8, wherein the wherein the first side of the baffle plate further comprises a plurality of bosses that maintain the first side of the baffle plate in a spaced-apart relation with the second surface of the lid.

13. The lid assembly of claim 12, wherein at least one of the bosses has a mounting hole disposed therethrough.

14. The lid assembly of claim 8, wherein the first side of the baffle plate further comprises a ring circumscribing the recess that maintains the first side of the baffle plate in a spaced-apart relation with the second surface of the lid.

15. The lid assembly of claim 8, wherein the first side of the baffle plate further comprises a ring circumscribing the recess and a plurality of bosses disposed radially outward of the ring, the ring and bosses maintaining the first side of the baffle plate in a spaced-apart relation with the second surface of the lid.

16. The lid assembly of claim 15, wherein the ring and bosses extend from the first side of the baffle plate to a common elevation.

17. The lid assembly of claim 8, wherein the second surface of the lid further comprises a plurality of recesses formed therein that reduce the contact area with the first side of the baffle plate.

18. The lid assembly of claim 8, wherein the lid further comprises a thermal control channel adapted to flow a heat transfer fluid therethrough.

19. The lid assembly of claim 8, wherein the gas manifold further comprises a conduit disposed therein adapted to flow a heat transfer fluid therethrough.

20. The lid assembly of claim 8, wherein the gas manifold further comprises a fourth channel coupled between the upper surface and the third channel.

21. The lid assembly of claim 20 further comprising:  
a cleaning source fluidly coupled to the fourth channel.

22. The lid assembly of claim 8 further comprising:  
a valve coupled to the gas manifold; and  
a gas reservoir fluidly coupled proximate the valve.

23. The lid assembly of claim 22 further comprising:  
a thermal conditioning channel disposed in the gas manifold fluidly coupling the valve and the gas reservoir.

24. The lid assembly of claim 8 further comprising:  
a thermal conditioning channel disposed in the gas manifold; and  
a valve coupled between the thermal conditioning channel and the first channel.

25. A lid assembly for a semiconductor processing system, said lid assembly comprising:

a lid having first and second opposed surfaces, the first and second opposed surfaces having a plurality of inlet channels disposed therethrough;

a valve;

a gas manifold coupled to the first surface of the lid, the gas manifold comprising:

a body having an upper surface and lower surface;

a plurality of gas channels extending through the gas manifold to the lower surface; and

a thermal conditioning channel disposed in the gas manifold fluidly coupled to at least one of the plurality of gas channels by the valve.

26. The lid assembly of claim 25, wherein the lower surface further comprises:

a mounting surface projecting outwards from the lower surface and maintaining the lower surface of the gas manifold and second surface of the lid in a spaced-apart relation.

27. The lid assembly of claim 25, wherein the lid further comprises a thermal control channel adapted to flow a heat transfer fluid therethrough.

28. The lid assembly of claim 25, wherein the gas manifold further comprises a conduit disposed therein adapted to flow a heat transfer fluid therethrough.

29. The lid assembly of claim 25, wherein the gas manifold further comprises a cleaning agent supply channel coupled between the upper surface and one of the plurality of channels.

30. The lid assembly of claim 29 further comprising:

a cleaning source fluidly coupled to the cleaning agent supply channel.

31. The lid assembly of claim 25 further comprising a gas reservoir fluidly coupled to the valve by the thermal conditioning channel.

32. The lid assembly of claim 25 further comprising:

a baffle plate having a first side and a second side, the first side coupled to the second surface of the lid and having a recess formed therein, the recess defining a plenum with the second surface of the lid and fluidly communicating with the plurality of channels via the inlet channels disposed in the lid, the baffle plate having a center passage disposed therethrough providing a singular passageway between the plenum and the second side of the baffle plate.

33. The lid assembly of claim 32, wherein the second surface of the lid further comprises a plurality of recesses formed therein that reduce the contact area with the first side of the baffle plate.

34. The lid assembly of claim 32, wherein the baffle plate further comprises a mixing lip defined by a bottom of the recess and the center passage, the mixing lip having an inner tip disposed radially inwards of the inlet passages.

35. The lid assembly of claim 34, wherein the tip is rounded.

36. The lid assembly of claim 34, wherein the mixing lip further comprises a sculpted surface.

mixing lip defines an acute angle with the second side of the baffle plate.

37. The lid assembly of claim 32, wherein the wherein the first side of the baffle plate further comprises a plurality of bosses that maintain the first side of the baffle plate in a spaced-apart relation with the second surface of the lid.

38. The lid assembly of claim 37, wherein at least one of the bosses has a mounting hole disposed therethrough.

39. The lid assembly of claim 32, wherein the first side of the baffle plate further comprises a ring circumscribing the recess that maintains the first side of the baffle plate in a spaced-apart relation with the second surface of the lid.

40. The lid assembly of claim 32, wherein the first side of the baffle plate further comprises a ring circumscribing the recess and a plurality of bosses disposed radially outward of the ring, the ring and bosses maintaining the first side of the baffle plate in a spaced-apart relation with the second surface of the lid.

41. The lid assembly of claim 40, wherein the ring and bosses extend from the first side of the baffle plate to a common elevation.

42. A lid assembly for a semiconductor processing system having an internal volume, said lid assembly comprising:

a lid having first and second opposed surfaces, the first and second opposed surfaces having a plurality of inlet channels disposed therethrough;

a valve;

a body having a lower surface coupled to the first surface of the lid;

at least one gas channel extending through the body from the lower surface and branching into a first gas channel and a second gas channel; and

a third channel disposed through the body and fluidly coupled by the valve to the second channel.

43. The lid assembly of claim 42, wherein the valve is mounted to the body.

44. The lid assembly of claim 42 further comprising a reservoir fluidly coupled between the valve and a fitting disposed on the lid.

45. The lid assembly of claim 42 further comprising:  
a cleaning source coupled to the first channel.
46. The lid assembly of claim 42 further comprising:  
a baffle plate having a first side and a second side, the first side coupled to the second surface of the lid and having a recess formed therein, the recess defining a plenum with the second surface of the lid and fluidly communicating with the first, second and third channels via the inlet channels disposed in the lid, the baffle plate having a center passage disposed therethrough providing a singular passageway between the plenum and the second side of the baffle plate.
47. The baffle plate of claim 46, wherein the wherein the first side of the baffle plate further comprises a plurality of bosses extending therefrom that maintain the baffle plate and the lid in a spaced-apart relation.
48. A lid assembly for a semiconductor processing system having an internal volume, said lid assembly comprising:  
a lid having first and second opposed surface;  
a plenum defined between the first and the second surfaces;  
a plurality of inlet channels disposed through first surface and coupled to the plenum;  
a center passage disposed through the second surface and coupled to the plenum providing a singular passageway between the plenum and the second surface of the lid; and  
a mixing lip extending into the center passage, the mixing lip having an inner tip disposed radially inwards of the inlet passages.
49. The lid assembly of claim 48, wherein the tip is rounded.
50. The lid assembly of claim 48, wherein the mixing lip further comprises a sculpted surface.  
mixing lip defines an acute angle with the second surface of the lid.



51. The lid assembly of claim 48 further comprising:
- a valve; and
  - a gas manifold coupled to the first surface of the lid, the gas manifold comprising:
    - a body having an upper surface and lower surface;
    - a plurality of gas channels extending through the gas manifold to the lower surface; and
    - a thermal conditioning channel disposed in the gas manifold fluidly coupled to at least one of the plurality of gas channels by the valve.